

QUESTIONS:**1. Which of the following statements regarding Quality Characteristics are true?**

- The features of your product that your customers are willing to pay for are called product specifications.
- The best way to translate your customers needs into product features is the use of the Quality Function Deployment tool.
- All Quality Characteristics are equally important to the customer.
- Your design process should focus on the critical few quality characteristics that drive customer satisfaction.

2. Delivering a high-quality product starts with:

- Determining your products specification
- Aligning your product design with your manufacturing process
- Capturing your customers' needs
- Analyzing your competition and differentiating yourself from them

3. Which of the following statements regarding Quality Characteristics are false?

- Classifying your customer needs allows you to identify your products features that are critical to quality, safety & performance.
- The classification process takes advantage of the 80/20 rule.
- Classifying your customer needs allows you to focus your design resources on the most critical characteristics .
- Quality Characteristics and their criticality are cascaded into the design of your product & process.

4. A product feature whose failure could result in a hazardous situation for your customer is normally defined as a:

- A Critical Quality Characteristic
- A Major Quality Characteristic
- A Minor Quality Characteristic
- An Incidental Quality Characteristics

5. A team of engineers has been tasks with improving the cycle time of a production process. The team wants to start by analyzing the key steps in the process to identify any bottlenecks or wait periods. Which tool would be most appropriate to analyze the process?

- Flow Chart
- Affinity Diagram
- Control Chart
- PERT Chart

6. **Fill in the blank: A _____ is a type of Bar Chart that graphs the frequency of occurrence of continuous data and is a useful tool for displaying, summarizing and analyzing data.**
- Pareto Chart
 - Scatter Plot
 - Histogram
 - Matrix Diagram
 - Control Chart
7. **Fill in the blank: A _____ design is used to study a process to determine which factors are critical and which are not.**
- Screening/Characterization Design
 - Comparative Design
 - Modeling/Optimization Design
 - Full Factorial Design
 - Orthogonal Array
8. **How many treatments would be required for a DOE with 10 factors where a full factorial design is chosen?**
- 64
 - 128
 - 256
 - 512
 - 1024
 - 2048
9. **Identify the two phrases below that best represents the meaning of the word Management in TQM:**
- All individuals in an organization should be engaged in the activity of continuous improvement.
 - The ultimate goal of continuous improvement is to meet the needs of the customer today and tomorrow.
 - All activities should be viewed as a process.
 - Senior leadership support is required for effectiveness within TQM.
 - An iterative process like PDCA should continuously be used.

10. You've been tasked with improving a process, and you want to establish the current state value stream map.

Which phase of the DMAIC process are you in?

- Define
- Measure
- Analyze
- Improve
- Control

11. A machine shop is planning to move a line of machining equipment across town and any delays in the project will result in lost business.

Which tool can be used to ensure that potential pitfalls in the project plan are identified and mitigated?

- Process Decision Program Chart
- Flow Chart
- Pareto Chart
- Activity Network Diagram
- Affinity Diagram

12. The Process Decision Program Chart is an extension of which of the 7 Quality Management & Planning Tools:

- Prioritization Matrix
- Affinity Diagram
- Tree Diagram
- Activity Network Diagram
- Interrelationship Digraph

13. What is the primary purpose of standardized work?

- To define the end-to-end activities within a value stream
- To implement a pull system to ensure that the flow of material only occurs at the pull of the customer
- To reduce the time required to change-over equipment
- To organize the workplace environment
- To eliminate defects and rework
- To capture the best, safety, most efficient method for conducting an activity

14. You're observing a production line and you know that the customer demand is 1000 units a day. The current operation is building 2000 units per day. What is the primary form of waste occurring here?

- Over-production
- Inventory
- Motion
- Defects
- Extra-Processing

15. During the validation of new equipment, you create a routine interval for equipment maintenance and replacement of parts prior to an equipment failure. Is the following example considered corrective or preventative actions?

- Corrective Action
- Preventative Action

16. Your customer has indicated that you often ship them an incorrect quantity of parts, so you implement a part counter into your assembly line. Is this considered corrective or preventative actions?

- Corrective Action
- Preventative Action

SOLUTIONS:**1. Which of the following statements regarding Quality Characteristics are true?**

- The features of your product that your customers are willing to pay for are called **product specifications (quality characteristics)**. (False)
- The best way to translate your customers needs into product features is the use of the Quality Function Deployment tool. (True)
- All Quality Characteristics are equally important to the customer - **the pareto principle tells us that there are a critical few quality characteristics that deliver the major of your customers satisfaction**. (False)
- Your design process should focus on the critical few quality characteristics that drive customer satisfaction. (True)

2. Delivering a high-quality product starts with:

- Determining your products specification
- Aligning your product design with your manufacturing process
- **Capturing your customers' needs**
- Analyzing your competition and differentiating yourself from them

The 1st step in designing a high-quality product is **capturing your customer's needs**.

3. Which of the following statements regarding Quality Characteristics are false?

- Classifying your **customer needs (quality characteristics)** allows you to identify your products features that are critical to quality, safety & performance. (False)
- The classification process takes advantage of the 80/20 rule. (True)
- Classifying your customer needs allows you to focus your design resources on the most critical characteristics. (True)
- Quality Characteristics and their criticality are cascaded into the design of your product & process. (True)

4. A product feature whose failure could result in a hazardous situation for your customer is normally defined as a:

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- A Major Quality Characteristic
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 - Full Factorial Design
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- 64
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 - 256
 - 512
 - **1024**
 - 2048

Full Factorial Design : $Number\ of\ Treatments = Levels^{Factors} = 2^{10} = 1024$

9. Identify the two phrases below that best represents the meaning of the word Management in TQM:

- All individuals in an organization should be engaged in the activity of continuous improvement.
- The ultimate goal of continuous improvement is to meet the needs of the customer today and tomorrow.
- **All activities should be viewed as a process.**
- **Senior leadership support is required for effectiveness within TQM.**
- An iterative process like PDCA should continuously be used.

10. You've been tasked with improving a process, and you want to establish the current state value stream map.

Which phase of the DMAIC process are you in?

- **Define**
- Measure
- Analyze
- Improve
- Control

Establishing the current state value stream map falls under the **Define** phase of DMAIC.

11. A machine shop is planning to move a line of machining equipment across town and any delays in the project will result in lost business.

Which tool can be used to ensure that potential pitfalls in the project plan are identified and mitigated?

- **Process Decision Program Chart**
- Activity Network Diagram
- Flow Chart
- Pareto Chart
- Affinity Diagram

The **Process Decision Program Chart** is meant to facilitate a review of a project plan to identify potential issues and develop contingencies and counter-measures to ensure project success.

12. The Process Decision Program Chart is an extension of which of the 7 Quality Management & Planning Tools:

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- Affinity Diagram
- **Tree Diagram**
- Activity Network Diagram
- Interrelationship Digraph

13. What is the primary purpose of standardized work?

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- **To capture the best, safety, most efficient method for conducting an activity**

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Building product before the customer demands it (1000 units per day) is a form of **over-production**.

Over-production is often the worst form of waste because it results in other forms of waste like Inventory & Motion. Thus, the primary form of waste here is over-production.

15. During the validation of new equipment, you create a routine interval for equipment maintenance and replacement of parts prior to an equipment failure. Is the following example considered corrective or preventative actions?

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- **Preventative Action**

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